FOR RETURN

納入仕様書
Product Specifications

☑ 新　規 (部品追加を含む)
New application (Including addition to approved parts)

☐ 仕様変更 (☐ 貴社 ☐ 納入者)
Specification revision ☐ by customer or ☐ by supplier)

貴社部品名
Customer's parts Name

貴社部品番号
Customer's parts number

弊社部品名
Supplier's parts name

弊社部品番号 F-4992-675-0(Boat)
Supplier's parts number F-4992-676-0(Air)

【受領印欄 Received Marking】

納 入 者 Supplier
ソニー株式会社
コンスーマー・プロフェッショナル&デバイスグループ
デバイスソリューション事業本部
Sony Corporation Consumer, Professional & Devices Group
Device Solutions Business Group

〒108-0075
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1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan

申請年月日 2013 年　01 月　14 日
Date of application (Y/M/D)

責任者名
Manager

技術担当名
Engineer Ono

営業担当名
Salesman Sano

仕様書番号 Spec. No.	KU-21951	Ver.	1.0

納入仕様書

Product Specifications

貴社名 :
Customer's name _____

貴社部品名 :
Customer's parts name _____

貴社部品番号 :
Customer's parts number _____

ソニー部品名 :
SONY parts name

_____

ソニー部品番号 : F-4992-675-0 (Boat)
SONY parts number F-4992-676-0 (Air)

_____

承 認 Approved by	確 認 Checked by	作 成 Prepared by
SEIDO '13.1.14 塩沼	SEIDO '13.1.9 小野	SEIDO '12.12.18 加藤

変更履歴
History of revisions

変更年月日 Date		変更事項 Description	承　認 Approved by	作　成 Prepared by
Ver.1.0	2012. 12.18	1ST issue		

Contents

Lithium-Ion Battery Specifications

1. General

1.1 Scope

This specification is applied to Lithium-Ion Rechargeable Battery provided by Sony.

1.2 Product Category: Lithium-Ion Rechargeable Battery

1.3 Cell Type US18650NC1

1.4 Acquired Safety Standard Approval UL1642: File No.MH12566
IEC62133 (INR19/66)

2. Cell Rating

Item		Rating	Note
2.1 Nominal Capacity		2900mAh	Discharge at 0.2ItA,2.5Vcutoff after Standard Charge
2.2 Rated Capacity		2750mAh	Discharge at 0.2ItA,2.5Vcutoff after Standard Charge
2.3 Nominal Voltage		3.6V	
2.4 Charge Voltage		4.20 +/- 0.05V	
2.5 Cut Off Voltage		2.5V	
2.6 Maximum Charge Voltage		4.25V	
2.7 Maximum Charge Current		3A	
2.8 Continuous Maximum Discharge Current		8A	
2.9 Weight		45.3+/- 1.5g	
2.10.1 Allowable Environment Temperature	Charge	0 to +45degC	
	Discharge	-20 to +60degC	
2.10.2 limit of cell surface temperature	Charge	60deg.C	
	Discharge	80deg.C	
2.11 Energy Density		588Wh/l	In case of over 400Wh/l, it is possibility to be subject to regulation by object country.

<Note> The cells must not be discharged when the environmental temperature is outside of the range of -20°C to 60°C. For discharging, it is acceptable for the cell surface temperature to rise to 80°C at maximum points.

※ Cell condition at the shipment ; About 70% discharged.

2.12 Charge Conditions

	Temperature Range		Upper Limited Charging Voltage	Maximum Charging Current	Charging Current Recommendation
1	Low Charging Temperature Range	0℃≦T＜10℃	4.25V	1.5A	0.963A
			4.15V	3A	1.925A
2	Standard Charging Temperature Range	10℃≦T＜45℃	4.25V	3A	1.925A
3	High Charging Temperature Range	45℃＜T≦60℃	4.15V	3A	1.925A

3. Shape/Dimension and Appearance

3.1 Shape/Dimension (Ref. P10 7. Outline)

	Diameter of crimp	18.2 +0.15 / -0.2mm
	Diameter of trunk	18.2 +0.15 /- 0.2 mm (excluding wrinkle on the tube)
	Total Length	65.00 +/- 0.2mm

3.2 Appearance

There shall be no remarkable scratches, stains, deformation, or leakage that could affect quality or reliability. Any uncertainty arising out of this phrase shall be settled upon consultation between both parties.

4. Performance

4.1 Standard Test Condition

Test condition shall be at 23 +/- 2degC and 65 +/- 20% R.H.

4.2 Testing Instrument or Apparatus

4.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm specified by JIS B 7502(outside micrometer) or JIS B 7503(dial gauge).

4.2.2 Voltmeter and Ammeter

Voltmeters and ammeters shall be equal or more precision instruments specified by JIS C 1102 (Indication Electric Instrument Level 0.5).

4.2.3 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

4.3 Standard Charge definition

Charging at a constant voltage of 4.2V and a constant current of 1.925A for 3.0 hours in 23±2℃ atmosphere.

4.4 Standard Discharge definition

Discharging at a constant current of 2.75A down to 2.5V in 23±2℃ atmosphere.

4.5 Electrical Performance

Item	Condition	Specification
4.5.1 Open-Circuit Voltage	Shipping condition	3.40-3.80V and the OCV shall be within 0.1V on the same cell lot.
4.5.2 AC Impedance	After standard charge within 3 days.(1kHz)	18-28mohm
4.5.3.1 Capacity	After standard discharging. Discharge at 0.2ItA(550mA) cut off voltage 2.5V	2750mAh or more
4.5.3.2 Capacity(2)	After standard charging, Standard discharging	2613mAh or more
4.5.3.3 Capacity(3)	After standard charging, Discharge at 6A cut off voltage 2.5V	2475mAh or more
4.5.3.4 Capacity(4)	After standard charging, Discharge at 8A cut off voltage 2.5V	2200mAh or more
4.5.4 Charge/Discharge Cycle	After charging 4.2V, 1A, 100mA cut off ←→ Discharge at 6A, cut off voltage 2.5V after 100 cycles	1925mAh or more
4.5.5 Discharging Temperature Characteristic	After standard charging, Discharge at 6A, 2.5V cut off under the following ambient temperature	Refer to the left table.
4.5.6 Charging Temperature Characteristic	After standard discharging, charge at 4.20V, 1.925A for 3.0 hours under the following ambient temperature.	Refer to the left table
4.5.7.1 Storage Characteristic(1)	After standard charging, stored at 23 degC for 28 days. Remaining capacity from 6A (2.5V cut off) discharging.	2228mAh or more
4.5.7.2 Storage Characteristic(2)	After above measurement, Recovery capacity by discharge at 6A, 2.5V cutoff after standard charge.	2352mAh or more
4.5.7.3 Storage Characteristic(3)	After standard charging, stored at 45 degC for 28 days. Remaining capacity from 6A (2.5V cut off) discharging.	2104mAh or more

Discharge Temperature	Capacity
-10degC	1733mAh or more
0degC	1980mAh or more
23degC	2475mAh or more
45degC	2475mAh or more

Charge Temperature	Capacity
0degC	2222mAh or more
23degC	2613mAh or more
45degC	2613mAh or more

4.5.7.4 Storage Characteristic(4)	After above measurement, Recovery capacity by discharge at 6A, 2.5V cutoff after standard charge.	2228mAh or more
4.5.8 Long term Storage characteristic	After standard Charging, store at 23 degC, 365days. Recovery capacity of standard charging and 6A(2.5V cut off) discharging.	2228mAh or more

4.6 Mechanical Performance

Item	Condition	Specification
4.6.1 Heat cycle test	1) Standard charge 2) Heat cycle at 75°C6h←30min→-40°C6h for 10 cycles. 3) Storage at 20±5°C for 24hours	No leakage, No interception
4.6.2 Shock test	1) Standard Charge 2) Drop the battery from 1.2m height onto P-tile for 3 times in each of X, Y and Z direction 3) Discharge at 6A, 2.5V cutoff 4) Standard charge 5) Capacity by discharge at 6A, 2.5V cutoff	No leakage 2352mAh or more
4.6.3 Vibration test	1) Standard charge 2) Vibration test under the following condition Frequency and acceleration:10～60Hz, 20.6m/s^2 Frequency and acceleration:60～80Hz, 13.7m/s^2 Frequency and acceleration:80～100Hz, 6.9m/s^2 Frequency and acceleration:100～125Hz, 3.9m/s^2 5min. sweep, 1 hour for each axes 3) Discharge at 6A, 2.5V cutoff 4) Standard charge 5) Capacity by discharge at 6A, 2.5V cutoff	No leakage. 2352mAh or more

5. Identification and Marking (Lot Number Definition: Manufacturing Date of Cells)
The code is printed on a surface of the can, under the tube, at three lines.

5.1 Manufacturer Name (Trade name)
SE (Trade name of Sony Energy Devices Corp.)

Fig.1

5.2 Trade Mark (Fig.1: USxxxxxx)
US18650NC1

5.3 Plant (Fig.1: A for plant code)
K: Sony Energy Devices Corp. Koriyama Plant. T: Sony Energy Devices Corp. Tochigi Plant.
SG or G: Sony Electronics (Singapore)

5.4 Specification (Fig.1.: HH for Cell Type)
1N: US18650NC1

5.5 Lot Number (Fig.1 : YMDDS for Manufacturing Date of Cells)
Y: Year '92 as A, Every next year is counted as B, C,... (Using an Alphabet letter)
M: Month January as A, the consecutive month as B, C,... (Using an Alphabet letter)
D: Day 01, 02, ・・・・29,30,31 (Using figures)
S: Electrode History A,B,C,・・ (Using an Alphabet letter)

5.6 UL Marking
Recognition Mark on the right side of Fig.1

5.7 2Dimensional Code (Fig.2)
The code is on the surface of the tube


Fig.2

6. Caution
Caution on usage of Lithium-Ion Rechargeable Battery.

6.1 Caution for installing the battery into the pack
*Do not combine the different Lot Number cell (the Last 5 letters and figure) into the pack

6.2 Caution for the battery and the pack
6.2.1 Charge
*It shall be Constant Current-Constant Voltage (CC-CV) charging method.

6.2.2 Discharge
*It shall avoid less than 2.5V by discharging.

6.2.3 Design of battery pack
*It shall be the shape which cannot be connected easily to any charger other than the dedicated charger.
*It shall have the structure which cannot be connected easily for end user to apply for the other purpose.
*It shall have the terminals or function which cannot easily cause external short circuit (such as chain short by necklace).
*It shall not be short easily by effect of vibration or drop due to contact of internal writing materials to battery.

6.2.4 Protection Circuit

*The protection circuit shall be installed in the battery pack, the Host or the charger.

*The battery must possess four types of protective circuits as follows.

6.2.4.1 Over charging protective circuit

The over charging protective circuit shall operate at less than 4.250V/cell by each block cell voltage monitoring.

6.2.4.2 Over discharging protective circuit

The over discharging protective circuit shall operate at 2.0V/cell to 2.5V/cell.
(In case of -10～-20deg.C, the circuit shall operate at 1.5V/cell to 2.5V/cell)

6.2.4.3 Over current protective circuit

The over current protective circuit shall operate charging at over 3A.
The over current protective circuit shall operate discharging over 8A.

6.2.4.4 Over temperature protective circuit at cell surface temperature

The over temperature protective circuit at high temperature side shall operate discharging until 80deg.C
The over temperature protective circuit at high temperature side shall operate charging at until 60degC.
The over temperature protective circuit at low temperature side shall operate charging until 0degC.

6.3 Storage

*It shall be kept in shipping condition (70% discharge) or over than 70% discharge condition to storage for long period.

*It shall be kept in dry condition of low humidity, especially be free from high temperature (45degC or more).
(Recommended Temperature 20degC. , Humidity 50% or less.)

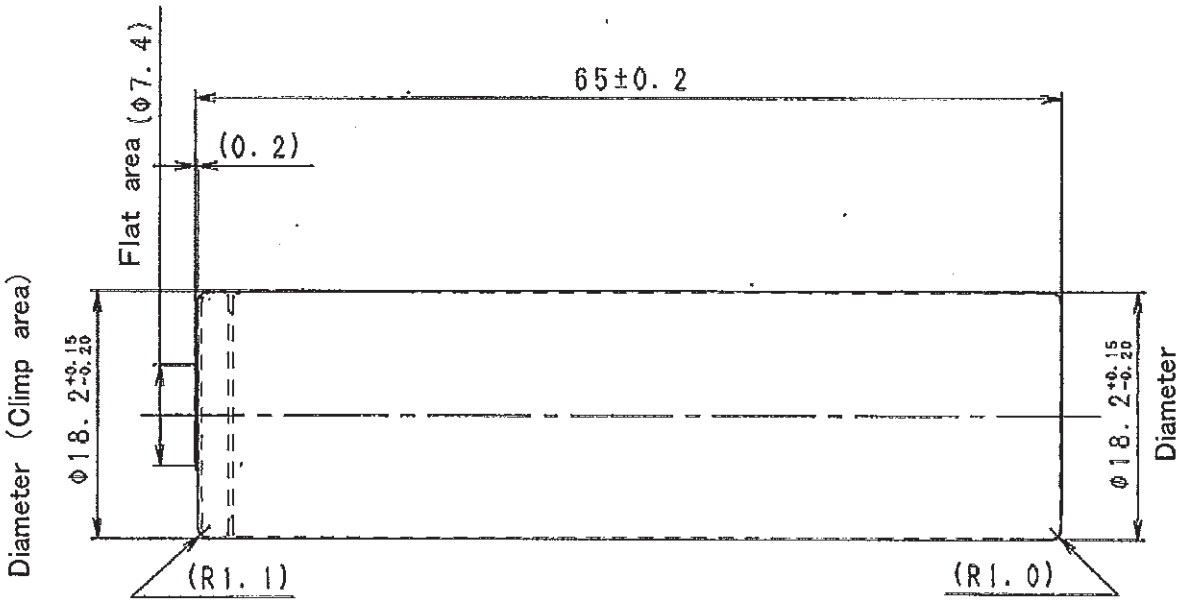
*Do not storage the battery near heat sources, nor in a place subject to direct sunlight to storage in warehouse.

*It shall be used the battery within 3 months (90 days) after shipping.

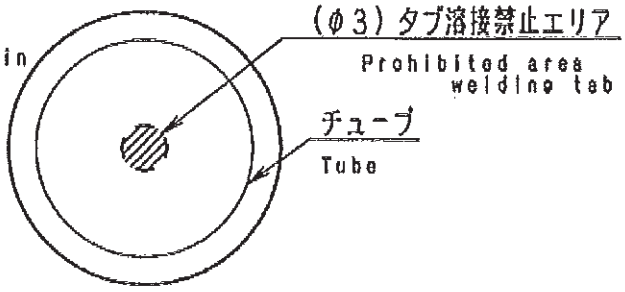
6.4 Prohibition Clause

*Do not throw the battery into fire, nor heat the battery.
*Do not disassemble nor modify the battery.
*Do not leave the battery in a place of high temperature (60degC or more).
*Do not use the battery in a place of high temperature (60degC or more).
*To prevent the battery from water or moisture.
*Do not add strong shock, nor drop the battery.
*Do not solder lead directly to the battery body.
*Do not short (+) and (−) terminal of the battery with a kind of metal.
*Do not charge beyond the condition which described on the delivery specification.
*Do not reverse charge the battery.
*Do not use together with the battery of a different kind.
*Do not penetrate the battery with a nail etc., nor make a hole in the battery.
*Do not put the battery into a microwave oven, nor high pressure container.
*Do not connect the battery to wall sockets and cigarette wall sockets in vehicle, etc.

7.Outline



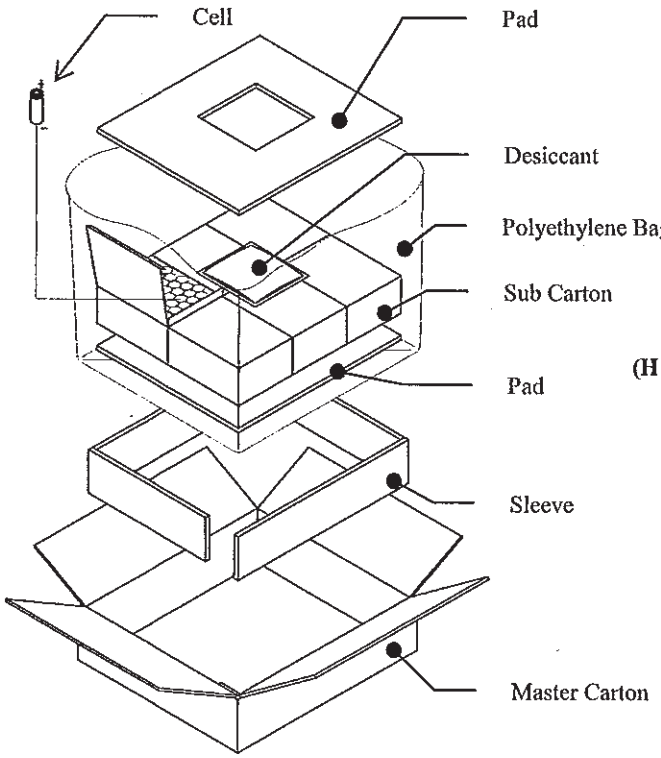
ボトム部タブ溶接禁止エリア
Prohibited area tab welding the bottom portin
右図のように、中心部からφ3の範囲は溶接しないこと
As shown in the figure on the right,
don't weld in the renge of φ3 from center

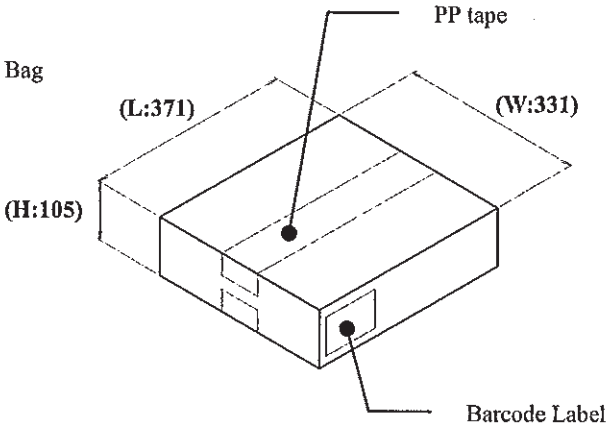


8. Packing

8.1 Packing Instruction

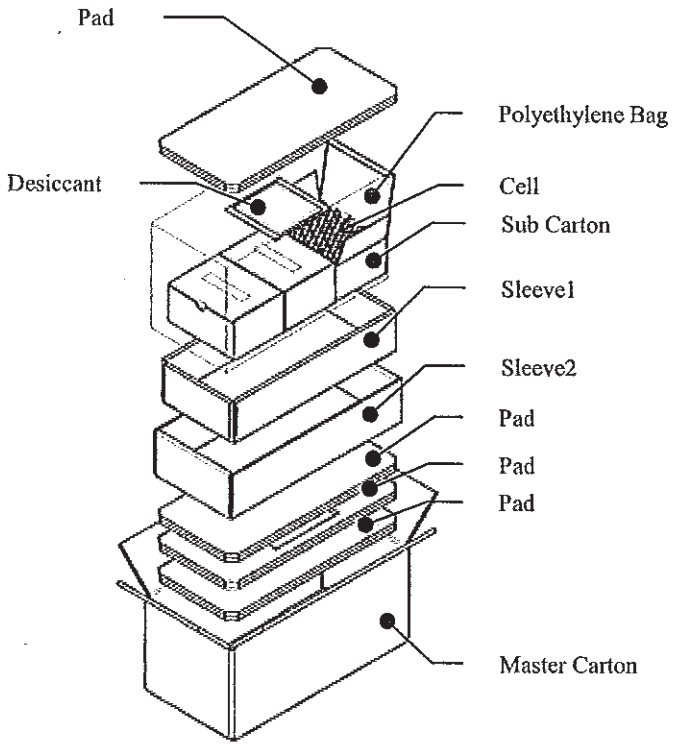
8.1.1 Boat transport specifications

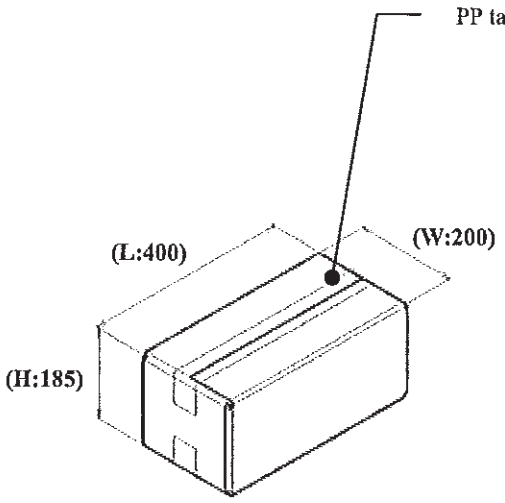




Qty : 300pcs / box

8.1.2 Air transport specifications

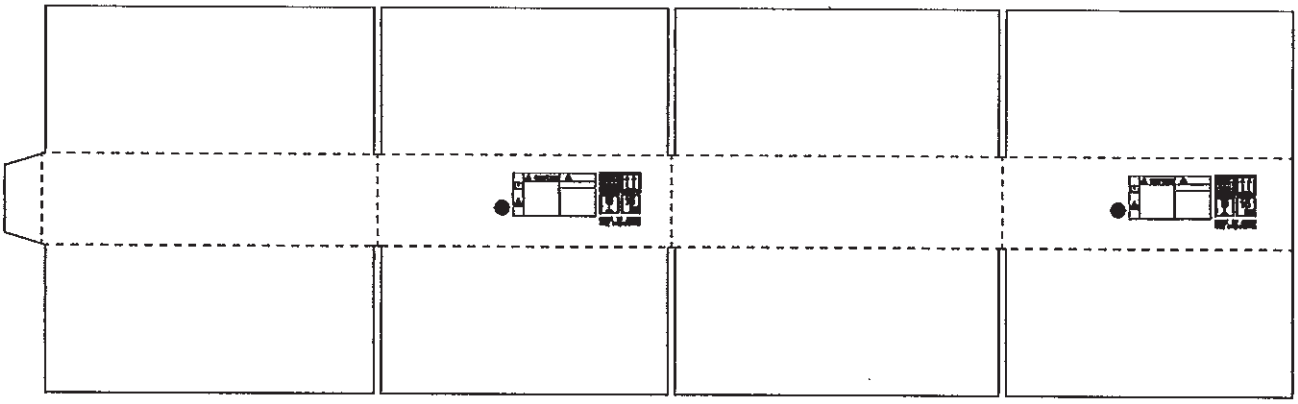


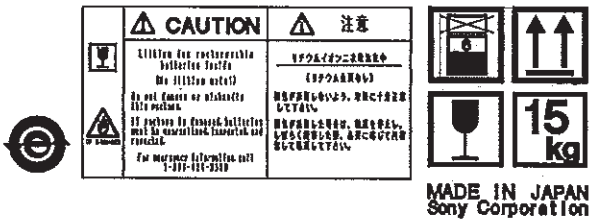


Qty : 150pcs / box

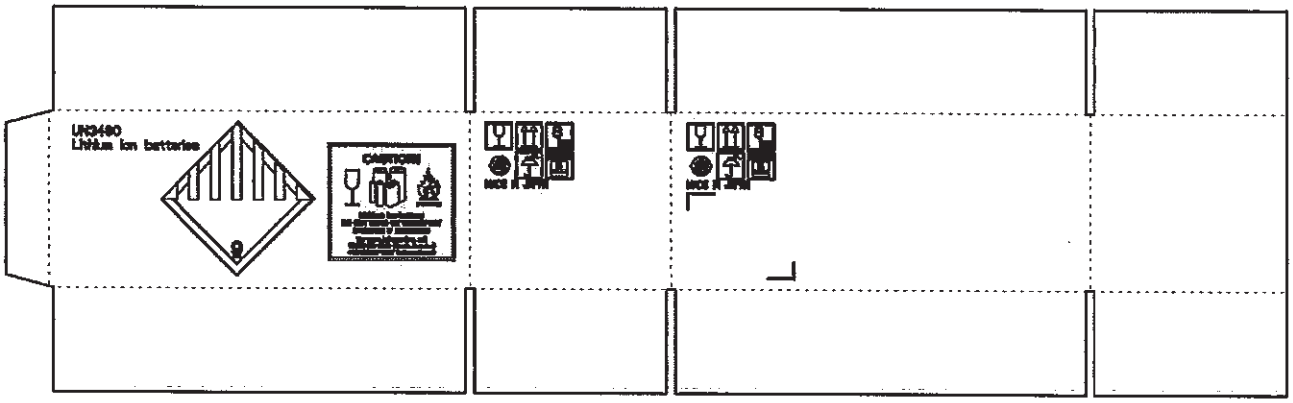
8.2 Printing Instruction for Master Carton

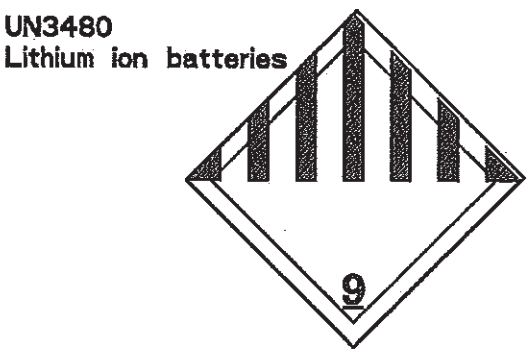
8.2.1 Boat transport specifications

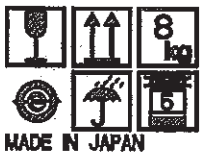




8.2.1 Air transport specifications

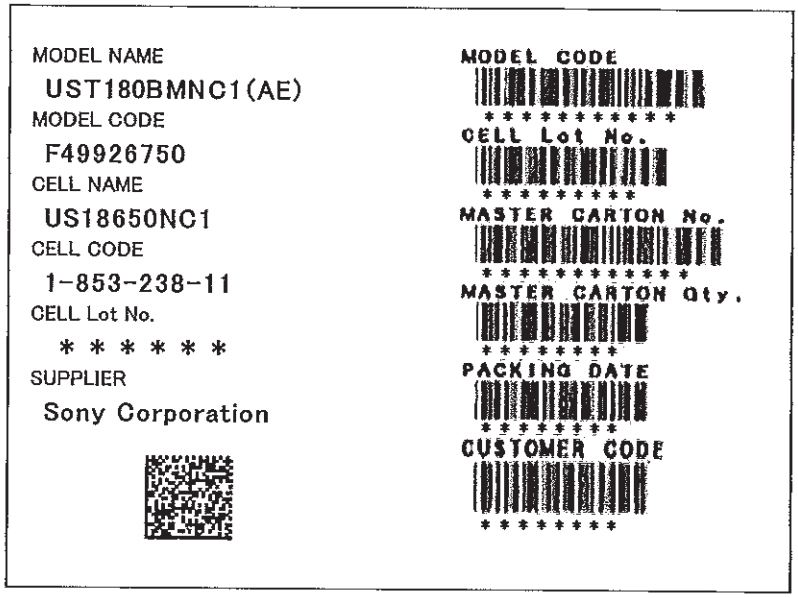




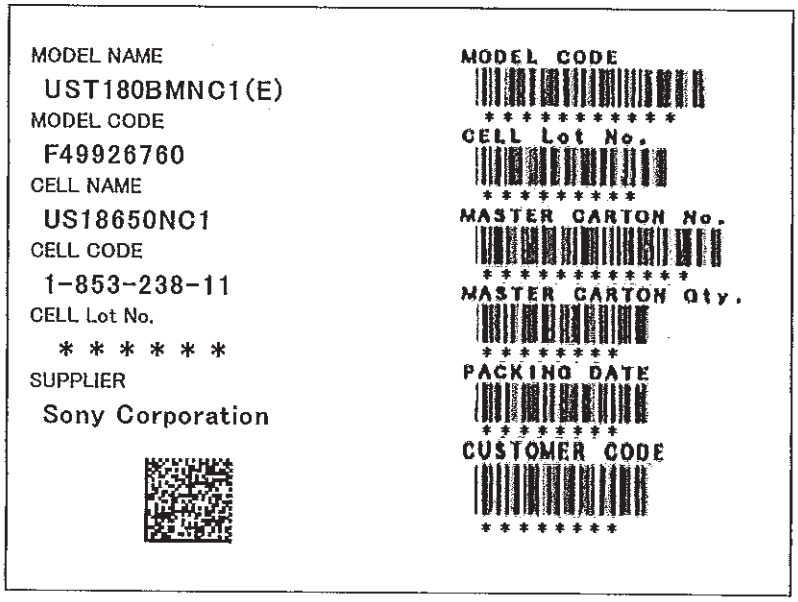


8.3 Parts name marking

8.2.1 Boat transport specifications

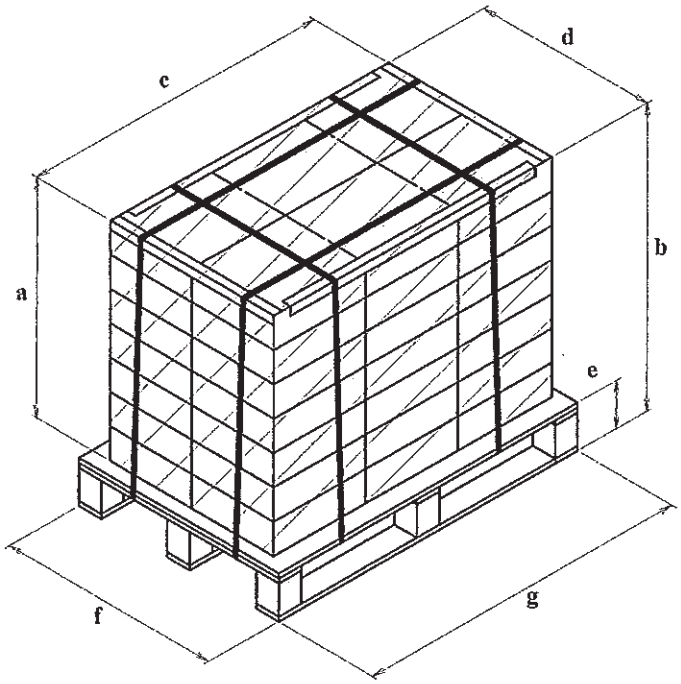


8.2.2 Air transport specifications



8.4 Packing Instruction for Pallet

8.4.1 Boat transport specifications



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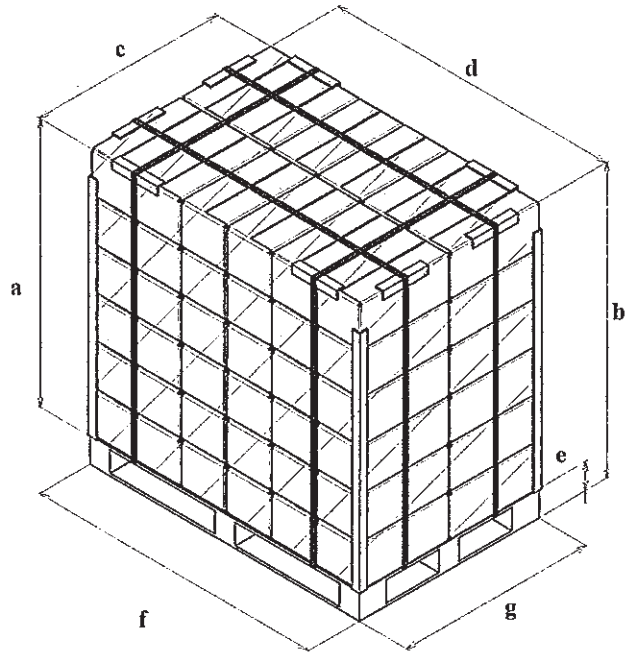
d :662
e :126
f :800
g :1200

8.4.2 Air transport specifications



Size (mm)
a :1110
b :1286
c :800
d :1200
e :126
f :800
g :1200

Reference

In case of the energy density is more than 400Wh/l (see 2.11), it is possibility to be subject to regulation by object country. It is recommend to confirm the contents of regulation.

As of October 2012.

Japan, Electrical Appliance and Material Safety Law

http://www.meti.go.jp/policy/consumer/seian/denan/index.htm

Korea, Electrical Appliances Safety Control Act

http://www.safetykorea.kr/